

What is claimed is:

1. A food refrigeration and rethermalization system comprising:

(a) a cart comprising:

5 (i) a housing including opposed first and second sidewalls, a thermal partition that divides an interior space in the housing into a cold chamber and a hot chamber, and a substantially open front;

10 (ii) a vertically oriented cold air plenum formed between the first sidewall of the housing and a cold air distribution panel, the cold air plenum having a substantially open front end and a closed back end, and the cold air distribution panel having a plurality of cold air vents forming a plurality of cold air flow paths between the cold air plenum and the cold chamber;

15 (iii) a vertically oriented hot air plenum formed between the second sidewall of the housing and a hot air distribution panel, the hot air plenum having a substantially open front end and a closed back end, and the hot air distribution panel having a plurality of hot air vents forming a plurality of hot air flow paths between the hot air plenum and the hot chamber; and

(b) a docking station comprising:

20 (i) a cold air supply system for supplying forced chilled air into the substantially open front end of the cold air plenum;

(ii) a hot air supply system for supplying forced heated air into the substantially open front end of the hot air plenum; and

(iii) one or more seals configured to provide substantially air-tight mating engagement between the docking station and the front of the cart when the cart is docked to the docking station.

5 2. A food refrigeration and rethermalization system according to Claim 1 wherein the cold air vents are configured so as to cause cold air to flow substantially evenly throughout the cold chamber, and the hot air vents are configured so as to cause hot air to flow substantially evenly throughout the hot chamber.

10 3. A food refrigeration and rethermalization system according to Claim 1 wherein the cart further comprises a front door for selectively closing the substantially open front of the housing.

15 4. A food refrigeration and rethermalization system according to claim 1 wherein the housing further comprises a substantially open back, and wherein the cart further comprises a back door for selectively closing the substantially open back of the housing.

5. A food refrigeration and rethermalization system according to claim 1 wherein the cart further comprises at least one cold air baffle in the cold air plenum.

20 6. A food refrigeration and rethermalization system according to claim 1 wherein the cart further comprises at least one hot air baffle in the hot air plenum.

7. A food refrigeration and rethermalization system according to claim 1 wherein the cart further comprises a plurality of tray supports in the housing, the tray supports being configured to support a plurality of trays in at least one spaced vertical array in the housing.

5 8. A food refrigeration and rethermalization system according to claim 1 wherein the hot air supply system includes at least one heater, at least one blower, and at least one hot air guide for directing air from the heater and blower into the substantially open front end of the hot air plenum.

10 9. A food refrigeration and rethermalization system according to claim 1 wherein the cold air supply system includes a refrigeration system, at least one blower, and at least one cold air guide for directing air from the refrigeration system and blower into the substantially open front end of the cold air plenum.

15 10. A food refrigeration and rethermalization system according to claim 1 wherein the housing further comprises a top and a bottom, and wherein the first and second sidewalls, the top, and the bottom comprise thermal insulation.

11. A food service cart comprising:

20 (a) a housing including a bottom, a top, a first sidewall, a second sidewall, a substantially open front, and an interior space;

(b) a thermal partition in the housing, the thermal partition dividing the interior space of the housing into a cold food compartment and a hot food compartment;

(c) a cold air plenum in the housing adjacent to and substantially coextensive with the first sidewall of the housing, the cold air plenum including a cold air intake port and a cold air distribution panel having a plurality of cold air vent openings therein;

5 (d) a hot air plenum in the housing adjacent to and substantially coextensive with the second sidewall of the housing, the hot air plenum including a hot air intake port and a hot air distribution panel having a plurality of hot air vent openings therein;

(e) a movable front closure for selectively closing the substantially open front of the housing; and

(f) a plurality of casters on the bottom the housing;

10 (g) wherein the cold air plenum defines a cold air distribution path between the cold air intake port and the cold food compartment through the plurality of cold air vent openings, and the hot air plenum defines a hot air distribution path between the hot air intake port and the hot food compartment through the plurality of hot air vent openings.

15 12. A food service cart according to Claim 11, the cart further comprising at least one cold air baffle in the cold air plenum.

13. A food service cart according to Claim 11, the cart further comprising at least one hot air baffle in the hot air plenum.

20 14. A food service cart according to Claim 11 further comprising a plurality of food trays and a plurality of tray supports in the housing, the tray supports being configured and arranged to support the food trays in at least one spaced vertical array in the housing.

15. A food service cart according to Claim 14 wherein each food tray includes a hot food end, a cold food end, and a central portion therebetween, and wherein the thermal partition includes a plurality tray-receiving slots configured to receive the central portions of the food trays such that the hot food ends of the food trays are located in the hot food compartment, 5 and the cold ends of the food trays are located in the cold food compartment when the trays are in the spaced vertical array in the housing.

16. A food service cart according to Claim 11 wherein the housing further comprises a substantially open back and the cart further comprises a movable back closure for selectively 10 closing the substantially open back of the housing.

17. A food service cart according to Claim 11, wherein the top, bottom, and first and second sidewalls of the cart include thermal insulation.

15 18. A food service cart according to Claim 11, the cart being configured to mate with a docking station for supplying forced hot air into the hot air plenum through the hot air intake port and for supplying forced cold air into the cold air plenum through the cold air intake port.

20 19. A convection heating and cooling air distribution system for a food service cart of the type having opposed first and second sidewalls and side-by-side hot and cold chambers between the sidewalls, the system comprising:

(a) a cold air distribution panel including a plurality of cold air vent openings therein, the cold air distribution panel being substantially parallel to the first sidewall, spaced

from the first sidewall, and substantially coextensive with the first sidewall of the cart, thereby forming a cold air plenum between the first sidewall and the cold air distribution panel;

- (b) a cold air intake port at a front end of the cold air plenum;
- 5 (c) a cold air return path;
- (d) a hot air distribution panel including a plurality of hot air vent openings therein, the hot air distribution panel being substantially parallel to the second sidewall, spaced from the second sidewall, and substantially coextensive with the second sidewall of the cart, thereby forming a hot air plenum between the first sidewall and the hot air distribution panel;
- 10 (e) a hot air intake port at a front end of the hot air plenum;
- (f) a hot air return path;
- (g) whereby a quantity of forced cold air entering the cold air plenum through the cold air intake port exits the cold air plenum through the cold air vent openings in the cold air distribution panel such that the quantity of forced cold air is substantially evenly distributed in the cold chamber as the cold air passes from the cold air vent openings to the cold air return opening; and
- 15 (h) whereby a quantity of forced heated air entering the hot air plenum through the hot air intake port exits the hot air plenum through the hot air vent openings in the hot air distribution panel such that the quantity of forced heated air is substantially evenly distributed in the hot chamber as the heated air passes from the hot air vent openings to the hot air return opening.

20. A convection heating and cooling air distribution system according to Claim 19 further comprising at least one cold air baffle in the cold air plenum for directing flow of at least a portion of the quantity of forced chilled air inside the cold air plenum.

5 21. A convection heating and cooling air distribution system according to Claim 19 further comprising at least one hot air baffle in the hot air plenum for directing flow of at least a portion of the quantity of forced heated air inside the hot air plenum.

10 22. A convection heating and cooling air distribution system according to Claim 19 further comprising means for injecting forced heated air into the hot air intake port.

23. A convection heating and cooling air distribution system according to Claim 22 wherein the means for injecting forced heated air into the hot air intake port comprises a docking station comprising:

15 (a) at least one heater for heating air;
(b) at least one hot air blower;
(c) a heated air exit port configured to matingly engage the hot air intake port of the cart.

20 24. A convection heating and cooling air distribution system according to Claim 19 further comprising means for injecting forced chilled air into the cold air intake port.

25. A convection heating and cooling air distribution system according to Claim 24 wherein the means for injecting forced chilled air into the cold air intake port comprises a docking station comprising:

- (a) a refrigeration system for chilling air;
- 5 (b) at least one cold air blower;
- (c) a chilled air exit port configured to matingly engage the cold air intake port of the cart.

26. A convective air distribution system for a food service cart of the type having side-by-side hot and cold chambers arranged between opposed sidewalls of the cart, the system 10 comprising:

- (a) means for receiving forced heated air into the cart from an external source of forced heated air;
- (b) means for substantially evenly distributing a flow of forced heated air received from the external source throughout the hot chamber, wherein the heated air flows through the hot chamber in a direction that is substantially perpendicular to one of the 15 sidewalls of the cart;
- (c) means for receiving forced chilled air into the cart from an external source of forced chilled air; and
- 20 (d) means for substantially evenly distributing a flow of forced chilled air received from the external source of forced chilled air throughout the cold chamber, wherein the chilled air flows through the cold chamber in a direction that is substantially perpendicular to the sidewalls of the cart.

27. A convective air distribution system according to Claim 26 wherein the means for substantially evenly distributing a flow of forced heated air received from the external source throughout the hot chamber comprises a hot air plenum that is adjacent to and is substantially coextensive with one of the sidewalls of the cart.

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28. A convective air distribution system according to Claim 27 wherein the hot air plenum comprises at least one hot air baffle for directing a flow of heated air inside the hot air plenum.

10 29. A convective air distribution system according to Claim 26 wherein the means for substantially evenly distributing a flow of forced chilled air received from the external source throughout the cold chamber comprises a cold air plenum that is adjacent to and is substantially coextensive with one of the sidewalls of the cart.

15 30. A convective air distribution system according to Claim 29 wherein the cold air plenum comprises at least one cold air baffle for directing a flow of chilled air inside the cold air plenum.